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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/489,356	01/21/2000	Hong Shih	AM-1622.D1	5730

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APPLIED MATERIALS, INC.
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SANTA CLARA, CA 95050

EXAMINER	
ZERVIGON, RUDY	
ART UNIT	**PAPER NUMBER**
1763	

DATE MAILED: 01/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

Office Action Summary	Application No.	Appl[illegible](s)
	09/489,356	SHIH ET AL.
	Examiner	Art Unit
	Rudy Zervigon	1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 June 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,8-23 and 28-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *2,3,8-11,17 and 28-31* is/are allowed.

6)☒ Claim(s) *1,12-16,18-23 and 32-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1, 12, 13, 15-16, 18-23, and 32-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Quartarone (USPat. 5,104,514) in view of J.Linke et al ("Behavior of boron-doped graphites, plasma-sprayed B4C, and a-C/B:H as plasma-facing materials"). Quartarone teaches coating aluminum-based substrates (abstract). Specifically, Quartarone teaches:

i. Optionally, (column 1, lines 29-39) roughing a surface of a substrate to a value of surface finish Ra of 10.161-17.78μm RMS – claims 1(a), 8(a) "400-700microinches RMS" = 10.161-17.78μm RMS

ii. Anodizing the roughed surface - claims 1(b), 8(b)

iii. Coating the roughed and anodized surface with a "protective material" by "plasma spraying a ceramic material" (PECVD) - claims 1(c), 7

Quartarone does not teach that the protective coating of the roughened and anodized surface is boron carbide, and that the coating is only a partial coating. Quartarone does not teach roughing a surface of a substrate to a value of surface finish Ra of at least 2.5μm Ra RMS, and roughing a surface of a substrate to a value of surface finish Ra of no more than 7.6μm Ra RMS. Quartarone does not teach only anodizing a portion of the roughened surface, thereby producing two surfaces that are co-extensive where a portion (first surface) of the one first and second surface is the only roughened surface.

Linke et al teaches protecting plasma facing surfaces of plasma confining chambers by applying plasma CVD and plasma sprayed B4C grains (boron carbide; "Materials and Characterization", paragraphs 3-5; "Erosion Behavior", entire section). Specifically, J. Linke et al teaches:

i. A method of coating boron carbide, as B_4C grains between B_4C and $B_{13}C_3$, (CVD, "Materials and Characterization", paragraphs 3-5; "B/C ratios" - first sentence; "low-pressure plasma spray" - 6th paragraph, left column , page 228) on an stainless steel and other substrates ("Materials and Characterization", paragraph 4; "Inconel 600")

ii. Forming a boron carbide layer carbide upon the surface ("Materials and Characterization", paragraphs 3-5)

iii. The boron carbide layer of 25wt% of carbon relative to boron as represented by B_4C ("Materials and Characterization", paragraph 3)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use J.Linke et al's plasma sprayed boron carbide as Quartarone's "coated protective material" (claims 1(c), 8(c)) and for Quartarone to anodize a portion of the roughened surface including optimizing the roughening of the substrate to values Ra of less than 10.161μm RMS.

Motivation to use J.Linke et al's plasma sprayed boron carbide as Quartarone's "coated protective material" (claims 1(c), 8(c)) and for Quartarone to anodize a portion of the roughened surface is drawn to J.Linke's motivation to provide a material that resists chemical erosion and provides reduced contaminates which improves the plasma performance of plasma-facing components ("Impurity Production of a Boronized Wall") and to Quartarone's teaching that anodization after roughening is an optional step (column 1, lines 32-40). Further, it would be

obvious to those of ordinary skill in the art to optimize the range of Quartarone's surface finish Ra from 10.161μm RMS to Ra within the range 2.5μm < Ra < 7.6μm RMS (In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980); In re Hoeschele , 406 F.2d 1403, 160 USPQ 809 (CCPA 1969); Merck & Co. Inc . v. Biocraft Laboratories Inc. , 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied , 493 U.S. 975 (1989); In re Kulling , 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990), MPEP 2144.05).

3. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Quartarone (USPat. 5,104,514) in view of J.Linke et al as applied to claims 1, 12, 13, 15-16, 18-23, 32, and 33 above, and further in view of Kizawa (JP 63-203098). The teachings of both Quartarone and J.Linke are discussed above. However, both Quartarone and J.Linke do not teach thermal spraying of the boron carbide film.

Kizawa teaches a thermal spraying material (2, Abstract) of boron carbide on aluminum members.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize Kizawa's thermal spraying material of boron carbide.

Motivation for utilizing Kizawa's thermal spraying material of boron carbide on aluminum members is for an alternative and equivalent method of applying boron carbide film.

Allowable Subject Matter

4. Claims 2, 3, 8-11, 17, and 28-31 are allowed.

5. The following is a statement of reasons for the indication of allowable subject matter: None of the references of record teach the additional step of removing a portion of the anodized layer at a predetermined boundary.

Response to Arguments

6. Applicant's arguments filed June 6, 2003 have been fully considered but they are not persuasive.

7. Applicant states "Quaratrone makes no mention of anodizing only a portion of his torpedo surface". However, the Examiner identified that Quaratrone teaches to optionally, (column 1, lines 29-39) roughing a surface to protect it. In particular, Quaratrone also teaches the step of only anodizing (column 1, line 33):

"

As is well known, surface scars can increase the tendency for corrosion and a variety of procedures to improve the resistance of aluminum articles to surface marring have been used. Frequently, such surfaces are anodized and this also has the effect of improving the resistance to attack in a particular environment.

"

In particular, Quaratrone also teaches the step of only coating (column 1, line 35):

"

In other instances, the aluminum articles are coated with organic coating materials which will provide an element of sacrificial protection for the surface, and such organic coatings may be superior in corrosion resistance to anodizing in a number of hostile environments.

"

Conclusion

8. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (703) 305-1351. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after final fax phone number for the 1763 art unit is (703) 872-9311. The official before final fax phone number for the 1763 art unit is (703) 872-9310. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (703) 308-0661. If the examiner can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (703) 308-1633.

JEFFRIE R. LUND
PRIMARY EXAMINER